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Remarks

This communication is considered fully responsive to the first Office Action mailed March 19, 2007. Claims 1-23 were examined. Claims 1-23 stand rejected. Claims 1, 3, 4, 5, 11, 13, 15, and 16 are amended. No claims are canceled. New claims 24-30 have been added. Reexamination and reconsideration of the currently pending claims are respectfully requested.

Information Disclosure Statement

Applicant re-submits the information disclosure statement and copy of the non-patent literature cited therein. No additional fees are believed to be due because this was originally submitted with the application as originally filed. Applicant respectfully requests the Examiner consider the references.

Claim Rejections - 35 U.S.C. 112

The Office Action rejected claims 6 and 18 under 35 U.S.C. 112, second paragraph, as having insufficient antecedent basis for "the strained $\text{InAs}_y\text{P}_{1-y}$ buffer layer." Applicant believes that the amendments to claims 5 and 17 provide antecedent basis for "the strained $\text{InAs}_y\text{P}_{1-y}$ buffer layer" in claims 6 and 18, respectively. Applicant respectfully requests withdrawal of the rejection of claims 6 and 18.

Claim Rejections - 35 U.S.C. 102(b)

The Office Action rejected claims 1-23 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,518,934 to Forrest, et al. (hereinafter referred to as "Forrest"). Applicant respectfully traverses this rejection.

Claim 1 is amended to recite "a relaxed intermediate region" (emphasis added). Support for this amendment is found in the application as originally filed, e.g., in the specification at page 12, lines 13-15 (paragraph [0054] in the published application) stating "The intermediate region contains a displacement

layer that is lattice-matched to the active layer. The displacement layer may also contain a number of suitable heterointerfaces designed to limit dislocation propagation into the active region." See also, the specification at page 13, lines 6-21 (paragraphs [0060] to [0061] in the published application). Forrest fails to teach or suggest at least these recitations.

The Office Action cites to layer 27 in Forrest as disclosing these recitations. Figure 5A-5B in Forrest show a structure comprising a substrate 15 followed by a first active layer 9; followed by step-graded layers 21, 23, 25, and 17; followed by a second active layer 11; followed by step-graded layers 18, 27, 29, and 19; followed by a third active layer 13; followed by cap 31. See also col. 3, lines 8-10 where Forrest refers to layer 27 as a step-graded layer. There is no disclosure in Forrest that layer 27 is a relaxed intermediate region.

For at least the foregoing reasons claim 1 is believed to be allowable over the cited references and Applicant respectfully requests withdrawal of the rejection of claim 1.

Claims 2-12 depend from claim 1, which is believed to be allowable. Therefore, claims 2-12 are also believed to be allowable for at least the same reasons as claim 1. Withdrawal of the rejection of claims 2-12 is respectfully requested.

Claim 13 is also amended to recite "depositing a relaxed intermediate region on the buffer layer" (emphasis added). Forrest fails to teach or suggest at least these recitations as discussed above for claim 1. For at least the foregoing reasons claim 13 is believed to be allowable over the cited references and Applicant respectfully requests withdrawal of the rejection of claim 13.

Claims 14-23 depend from claim 13, which is believed to be allowable. Therefore, claims 14-23 are also believed to be allowable for at least the same

reasons as claim 1. Withdrawal of the rejection of claims 14-23 is respectfully requested.

In addition, new claims 26 and 30 further recite "the buffer layer is a compositional overshoot which compensates for residual strain in the buffer layer such that the lattice constant in a growth plain matches that of the relaxed lattice constant of both the intermediate region and the active layer." Support for this amendment is found in the application as originally filed, e.g., as indicated by the dashed line in the buffer layer shown in Figure 5 and the optimized point in Figure 4. See also the specification at page 3, lines 17-26 (paragraphs [0011] and [0012] in the published application). There is no teaching or suggestion in Forrest of at least these recitations. To the contrary, Forrest states that layer 27 does not exactly match that of the absorption layer 11. See, e.g., col. 3, lines 15-17.

New claim 27 further recites "wherein the intermediate region includes at least one displacement layer." Applicant has clearly defined the displacement layer as being distinct from the graded layers. See, e.g., page 4, lines 18-21 in the specification stating "An intermediate region containing a displacement layer is inserted between the buffer and active layers to spatially separate the active layer from the misfit dislocation networks that reside in the graded region, and to limit the propagation of threading dislocations into the active region" (paragraph [0015] of the published application). There is no teaching or suggestion in Forrest of at least these recitations.

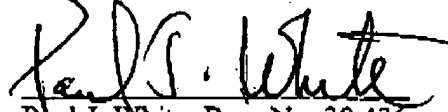
Conclusion

The Applicant respectfully requests that a timely Notice of Allowance be issued in this matter.

Dated:

6/27/07

Respectfully Submitted,



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